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slightly; and the occasional small electrostatic spark from the surface of the tube to the hair, but which was hardly noticeable, will also not account for this effect. JOHN DANIEL.

PHYSICAL LABORATORY,

VANDERBILT UNIVERSITY, March 23, 1896.

#### INSTINCT.

TO THE EDITOR OF SCIENCE: Having read with considerable interest the discussions under *Instinct*, and having noticed the different opinions expressed concerning the eating and drinking of the chick, I thought that perhaps my personal experiments in regard to the matter might be of interest.

About eight years ago I was desirous of studying the chick before and after hatching, and for this purpose I placed about three hundred eggs in an incubator. I shall confine myself to those that were allowed to hatch.

Those that hatched were divided into two groups, an unhealthy and a healthy group. Those in the first group were fed and given water until they became strong enough to care for themselves. Those in the second group had food and water placed so that they could get them, but they were not fed nor given water, nor were they taught how to secure food and water. No tapping on the dish or on the floor, and no putting of the bill in the food or water was practiced. They were left entirely to themselves.

By watching these chicks, I noticed that they would occasionally run over their food and water, and frequently they stumbled in them. If the beak became wet, up would go the head, and the water was swallowed. If food adhered to the beak, some would get on the tongue, and it would be swallowed. In time they seemed to recognize that the food and water were palatable by repeatedly stumbling in them and getting them on the beak, and finally they *learned* how to secure them, *i. e.*, how to pick them up. I noticed that at first they did not know how to pick up, but, after repeatedly trying, they learned how. The majority of these chicks lived and developed.

Now if we consider the attempt to pick up, from observation I conclude that it was by *instinct*; but if we consider the picking up, I conclude that it was an *acquired* characteristic.

In conclusion, I might say that at the end of the third day all of the chicks—about fifty—instinctively attempted to pick up, and that at the end of the fifth day they were able to pick up and place the food or water so that it could be swallowed.

J. C. HARTZELL, JR.

ORANGEBURG, S. C., March 25, 1896.

#### VISUALIZATION AND RETINAL IMAGE.

A STORY which has been going the rounds of the press about a successful attempt by Mr. Engles Rogers at photographing his own retinal image of a dead child, said image being produced by visualizing effort, induces me to suggest through SCIENCE that the subject is worthy of more thorough investigation than it has yet received. What effect also hallucination has upon the retina might be determined from study of insane patients dead from hallucinatory fright, etc. In some cases of sudden death by accident there seems to be evidence of a persistence of retinal image; and it seems highly desirable that hospital surgeons should have a simple instrument for investigating such cases. An image which should represent other scenes than the surroundings at time of death might be evidence for mere visualization effecting a retinal image.

HIRAM M. STANLEY.

LAKE FOREST, ILL.

#### NAVAL EROSION.

TO THE EDITOR OF SCIENCE: An interesting locality for obtaining some measure of the interference of navigation with the normal geological cycle is the Kennebec River, in Maine. Several summers ago, chancing upon this river, I was struck with the completeness of the phenomena of erosion produced by our steamer in disturbing the water.

This stream is an estuary for nearly forty miles from its mouth. It has numerous islands and in many places steep banks. There is a vast amount of glacial material strewn along its shore which, with the matter brought down stream, has silted the river bottom completely. I noted all along the shore that the water in advance of the steamer rose slightly on the bank, but was immediately drawn back to fill the space just occupied by the boat. At some points this recession amounted to fifteen or twenty feet, and at no place was it less than